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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/669,722	09/25/2003	Chai Wah Wu	00280745AA	6417
30743 7590 08/15/2007 WHITHAM, CURTIS & CHRISTOFFERSON & COOK, P.C. 11491 SUNSET HILLS ROAD SUITE 340 RESTON, VA 20190			EXAMINER HIRL, JOSEPH P	
			ART UNIT	PAPER NUMBER
			2129	
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			08/15/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

**Application No.**

10/669,722

**Applicant(s)**

WU ET AL.

**Examiner**

Joseph P. Hirl

**Art Unit**

2129

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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### **DETAILED ACTION**

1. Claims 1-25 are pending in this application.

### ***Claim Objections***

2. Claim 4 cites "computer system resources and resources" which is inclusive and is objected to. This claim must be amended to resolve this objection.

### ***Specification***

3. Claim 12 cites the limitation "Hessian  $\nabla^2 f$ " which is not addressed sufficiently in the specification such that one of ordinary skill in the art can implement the invention. This objection must be corrected.

### ***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section

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351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-25 are rejected under 35 U.S.C. 102(b) as being anticipated by anticipated by CSS (Introduction to Neural Networks, California Scientific Software, referred to as **CSS**).

Examiner's Note (EN): The concept of the invention maps into a neural network where the neural network is undergoing training using a training data set that represents an objective function that is not explicitly known (represented by the training data set) related to utility with the learning rate of Hebb's rule establishing the step size used in gradient descent to achieve utility optimization (CSS prior art references are cited below). Margin relates to a change (increase/decrease) in output value related to a change (increase/decrease) in the input value. The rejection is being made under 35 USC 102 and hence MPEP 2131.05 applies to include *Twin Disc, Inc. v. United States*, 231 USPQ 417, 424, (Cl. Ct. 1986) (quoting *In re Self*, 671 F.2d 1344, 213 USPQ 1, 7 (CCPA 1982)).

**Claims 1, 5**

CSS anticipates determining an initial step size (**CSS**, p100:17-24; p100:31-35; EN: ¶ 11. applies); evaluating step size effectiveness with only information on the marginal utility (**CSS**, p63:4-8; p100:35-38); reducing the step size if necessary (**CSS**, p63:4-20; p100:35-38); and deploying an effective step size for utility optimization (**CSS**, p63:4-20; p100:35-38).

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**Claims 2, 3, 4, 7, 8, 23, 24, 25**

CSS anticipates allocated resources are computer memory 2 resources (CSS, p13:33; EN: the process is optimization and database memory components, computer memory resources and optimal service level objectives are not functionally distinct in such processes ... the solution structure is the same) .

**Claim 9**

CSS anticipates starting from an initial allocation, calculating a marginal utility of said allocation (CSS, p134:4-7; p101:1; EN: such as the change in weight for a given input for a training set); calculating constraint functions of said allocation (CSS, p101:1; EN: such is determining the weight); applying the calculated constraint function information and marginal utility information to obtain a next allocation (CSS, p134:4-7; p101:1; EN: such is the next training iteration); repeating the steps of calculating a marginal utility, calculating constraint functions and applying the calculated constraint function information and marginal utility information until a stopping criteria is satisfied (CSS, p134:4-7; p101:1; p191:11-16); and returning a locally optimal allocation of resources (CSS, p8414-21; EN: local optimum is equivalent to an acceptance of many minimums or optimizations).

**Claim 10**

CSS anticipates marginal utility is the gradient of the function  $f$  (CSS, p122, diagram 8.2; p101:1; EN: the function  $f$  is embedded in the neural network via the structure and adjusted weights and the marginal utility is represented by the change in weights for a given change in input value).

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**Claim 11**

CSS anticipates only the gradient  $\nabla f$  is known and there is no procedure to evaluate the objective function  $f$  (CSS, p122, diagram 8.2; p101:1; EN: the gradient is established by the change in weight; the objective function is embedded in the structure and weights of the neural network).

**Claim 12**

CSS anticipates the gradient  $\nabla f$  and the Hessian  $\nabla^2 f$  are known and there is no procedure to evaluate the objective function  $f$  (CSS, p122, diagram 8.2; p101:1; EN: condition related to Hessian  $\nabla^2 f$  are not described in the specification and for this examination, the Hessian  $\nabla^2 f$  is assumed to a non factor (0)).

**Claim 13**

CSS anticipates the objective function is a utility function and the method maximizes the utility function (CSS, p100:17-24).

**Claims 14, 15, 16, 17, 18, 19, 20, 21**

CSS anticipates utility function is time saved (CSS, p100:17-24; EN: specifying the title of the utility function does not change the process of determining a representation of such utility, objective or cost function).

**Claim 22**

CSS anticipates a backtracking line search is implemented in which a step is decreased until the following condition is satisfied:  $(\nabla f(x + \alpha p) - c_1 \nabla f(x))^T p \leq 0$ , where  $p$  is a search direction,  $c_1$  is a constant, and  $(\nabla f(x + \alpha p) - c_1 \nabla f(x))^T p$  is the transpose of  $(\nabla f(x + \alpha p) - c_1 \nabla f(x))$  (CSS, p122, diagram 8.2; p101:1; EN: if  $\alpha = c_1 =$

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0 and  $f(x)$  has elements that are equivalent, then  $f(x) = f(x)^T$ , and the gradient is established by the change in weight; the objective function is embedded in the structure and weights of the neural network).

### ***Conclusion***

6. The prior art of record and not relied upon is considered pertinent to applicant's disclosure.

- Bar-ford et al., ACM I-581 I3-435-501, On the Marginal Utility of Network Topology Measurements
- Visweswariah, IEEE 0-89791-993-9/97, Optimization Techniques for High-Performance Digital Circuits
- Grun et al, Memory Size Estimation for Multimedia Applications

7. Claims 1-25 are rejected.

### ***Examination Considerations***

8. The claims and only the claims form the metes and bounds of the invention.

"Office personnel are to give the claims their broadest reasonable interpretation in light of the supporting disclosure. *In re Morris*, 127 F.3d 1048, 1054-55, 44USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. *In re Prater*, 415 F.2d, 1393, 1404-05, 162 USPQ

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541, 550-551 (CCPA 1969)" (MPEP p 2100-8, c 2, l 45-48; p 2100-9, c 1, l 1-4). The

Examiner has full latitude to interpret each claim in the broadest reasonable sense.

Examiner will reference prior art using terminology familiar to one of ordinary skill in the art. Such an approach is broad in concept and can be either explicit or implicit in meaning.

9. Examiner's Notes are provided with the cited references to prior art to assist the applicant to better understand the nature of the prior art, application of such prior art and, as appropriate, to further indicate other prior art that maybe applied in other office actions. Such comments are entirely consistent with the intent and spirit of compact prosecution. However, and unless otherwise stated, the Examiner's Notes are not prior art but a link to prior art that one of ordinary skill in the art would find inherently appropriate.

10. Unless otherwise annotated, Examiner's statements are to be interpreted in reference to that of one of ordinary skill in the art. Statements made in reference to the condition of the disclosure constitute, on the face of it, the basis and such would be obvious to one of ordinary skill in the art, establishing thereby an inherent prima facie statement.

11. Examiner's Opinion: ¶¶ 8.-10. The Examiner has full latitude to interpret each claim in the broadest reasonable sense.



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***Correspondence Information***

Any inquiry concerning this information or related to the subject disclosure should be directed to the Primary Examiner, Joseph P. Hirl, whose telephone number is (571) 272-3685. The Examiner can be reached on Monday – Thursday from 5:30 a.m. to 4:00 p.m.

As detailed in MPEP 502.03, communications via Internet e-mail are at the discretion of the applicant. Without a written authorization by applicant recorded in the applicant's file, the USPTO will not respond via e-mail to any Internet correspondence which contains information subject to the confidentiality requirement as set forth in 35 U.S.C. 122. A paper copy of such correspondence will be placed in the appropriate patent application. The following is an example authorization which may be used by the applicant:

Notwithstanding the lack of security with Internet Communications, I hereby authorize the USPTO to communicate with me concerning any subject matter related to the instant application by e-mail. I understand that a copy of such communications related to formal submissions will be made of record in the applications file.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, David R. Vincent can be reached at (571) 272-3080.

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Joseph P. Hirl  
Primary Examiner  
August 13, 2007